

TRYpanosomiasis¹

Drug	Adult dosage	Pediatric dosage
T. cruzi (American trypanosomiasis, Chagas' disease)		
Drug of choice: Nifurtimox*	8-10 mg/kg/d PO in 3-4 doses x 90-120d	1-10yrs: 15-20 mg/kg/d PO in 4 doses x 90-120d 11-16yrs: 12.5-15 mg/kg/d in 4 doses x 90-120d
OR Benznidazole ^{2*}	5-7 mg/kg/d PO in 2 doses x 30-90d	≤12yrs: 10 mg/kg/d PO in 2 doses x 30-90d >12 yrs: 5-7 mg/kg/d in 2 doses x 30-90d
T. brucei gambiense (West African trypanosomiasis, sleeping sickness) hemolymphatic stage		
Drug of choice: ³ Pentamidine ⁴	4 mg/kg/d IM x 7d	4 mg/kg/d IM x 7d
Alternative: Suramin*	100-200 mg (test dose) IV, then 1 g IV on days 1,3,7,14 and 21	20 mg/kg on d 1,3,7,14 and 21
Late disease with CNS involvement		
Drug of Choice: Eflornithine ^{5*}	400 mg/kg/d IV in 4 doses x 14d	400 mg/kg/d IV in 4 doses x 14d
OR Melarsoprol ⁶	2.2 mg/kg/d IV x 10d	2.2 mg/kg/d IV x 10d
T. b. rhodesiense (East African trypanosomiasis, sleeping sickness) hemolymphatic stage		
Drug of choice: Suramin*	100-200 mg (test dose) IV, then 1 g IV on days 1,3,7,14 and 21	20 mg/kg on d 1,3,7,14 and 21
Late disease with CNS involvement		
Drug of choice: Melarsoprol ⁶	2-3.6 mg/kg/d IV x 3d; after 7d 3.6 mg/kg/d x 3d; repeat again after 7d	2-3.6 mg/kg/d x 3d; after 7d 3.6 mg/kg/d x 3d; repeat again after 7d

* Availability problems. See table below.

1. MP Barrett et al, Lancet 2003; 362:1469. Treatment of chronic or indeterminate Chagas' disease with benznidazole has been associated with reduced progression and increased negative seroconversion (R Viotti et al, Ann Intern Med 2006; 144:724).

2. Benznidazole should be taken with meals to minimize gastrointestinal adverse effects. It is contraindicated during pregnancy.

3. Pentamidine and suramin have equal efficacy, but pentamidine is better tolerated.

4. Not FDA-approved for this indication.

5. Eflornithine is highly effective in *T.b. gambiense*, but not in *T.b. rhodesiense* infections. In one study of treatment of CNS disease due to *T.b. gambiense*, there were fewer serious complications with eflornithine than with melarsoprol (F Chappuis et al, Clin Infect Dis 2005; 41:748). Eflornithine is available in limited supply only from the WHO. It is contraindicated during pregnancy.

6. E Schmid et al, J Infect Dis 2005; 191:1922. Corticosteroids have been used to prevent arsenical encephalopathy (J Pepin et al, Trans R Soc Trop Med Hyg 1998; 89:92). Up to 20% of patients with *T.b. gambiense* fail to respond to melarsoprol (MP Barrett, Lancet 1999; 353:1113). In one study, a combination of low-dose melarsoprol (1.2 mg/kg/d IV) and nifurtimox (7.5 mg/kg PO bid) x 10d was more effective than standard-dose melarsoprol alone (S Bisser et al, J Infect Dis 2007; 195:322).

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MANUFACTURERS OF DRUGS USED TO TREAT PARASITIC INFECTIONS

albendazole – <i>Albenza</i> (GlaxoSmithKline)	§ <i>Egaten</i> (Novartis) – triclabendazole
<i>Albenza</i> (GlaxoSmithKline) – albendazole	<i>Elimite</i> (Allergan) – permethrin
<i>Alinia</i> (Romark) – nitazoxanide	<i>Ergamisol</i> (Janssen) – levamisole
<i>AmBisome</i> (Gilead) – amphotericin B, liposomal	<i>Eurax</i> (Westwood-Squibb) – crotamiton
amphotericin B – <i>Fungizone</i> (Apothecon), others	• <i>Flagyl</i> (Pfizer) – metronidazole
amphotericin B, liposomal – <i>AmBisome</i> (Gilead)	§ <i>Flisint</i> (Sanofi-Aventis, France) – fumagillin
<i>Ancobon</i> (Valeant) – flucytosine	fluconazole – <i>Diflucan</i> (Pfizer), others
§ <i>Antiminth</i> (Pfizer) – pyrantel pamoate	flucytosine – <i>Ancobon</i> (Valeant)
• <i>Aralen</i> (Sanofi) – chloroquine HCl and chloroquine phosphate	§ fumagillin – <i>Flisint</i> (Sanofi-Aventis, France)
§ artemether – <i>Arteman</i> (Arenco, Belgium)	• <i>Fungizone</i> (Apothecon) – amphotericin
§ artemether/lumefantrine – <i>Coartem, Riamet</i> (Novartis)	§ <i>Furamide</i> (Boots, United Kingdom) – diloxanide furoate
§ <i>Arteman</i> (Arenco, Belgium) – artemether	§ furazolidone – <i>Furozone</i> (Roberts)
§ artesunate – (Guilin No. 1 Factory, People's Republic of China)	§ <i>Furozone</i> (Roberts) – furazolidone
atovaquone – <i>Mepron</i> (GlaxoSmithKline)	† <i>Germanin</i> (Bayer, Germany) – suramin sodium
atovaquone/proguanil – <i>Malarone</i> (GlaxoSmithKline)	§ <i>Glucantime</i> (Aventis, France) – meglumine antimonate
azithromycin – <i>Zithromax</i> (Pfizer), others	† <i>Hetrazan</i> – diethylcarbamazine citrate (DEC)
• <i>Bactrim</i> (Roche) – TMP/Sulfa	§ <i>Humatin</i> (Monarch) – paromomycin
§ benznidazole – <i>Rochagan</i> (Brazil)	§ <i>Impavido</i> (Zentaris, Germany) – miltefosine
§ <i>Biaxin</i> (Abbott) – clarithromycin	iodoquinol – <i>Yodoxin</i> (Glenwood), others
§ <i>Biltricide</i> (Bayer) – praziquantel	itraconazole – <i>Sporanox</i> (Janssen-Ortho), others
† bithionol – <i>Bitin</i> (Tanabe, Japan)	ivermectin – <i>Stromectol</i> (Merck)
† <i>Bitin</i> (Tanabe, Japan) – bithionol	ketoconazole – <i>Nizoral</i> (Janssen), others
§ <i>Brolene</i> (Aventis, Canada) – propamidine isethionate	† <i>Lampit</i> (Bayer, Germany) – nifurtimox
chloroquine HCl and chloroquine phosphate – <i>Aralen</i> (Sanofi), others	<i>Lariam</i> (Roche) – mefloquine
clarithromycin – <i>Biaxin</i> (Abbott), others	§ <i>Leshcutan</i> (Teva, Israel) – topical paromomycin
• <i>Cleocin</i> (Pfizer) – clindamycin	levamisole – <i>Ergamisol</i> (Janssen)
clindamycin – <i>Cleocin</i> (Pfizer), others	lumefantrine/artemether – <i>Coartem, Riamet</i> (Novartis)
<i>Coartem</i> (Novartis) – artemether/lumefantrine	<i>Malarone</i> (GlaxoSmithKline) – atovaquone/proguanil
crotamiton – <i>Eurax</i> (Westwood-Squibb)	malathion – <i>Ovide</i> (Medicis)
dapsone – (Jacobus)	mebendazole – <i>Vermox</i> (McNeil), others
§ <i>Daraprim</i> (GlaxoSmithKline) – pyrimethamine USP	mefloquine – <i>Lariam</i> (Roche)
† diethylcarbamazine citrate (DEC) – <i>Hetrazan</i>	§ meglumine antimonate – <i>Glucantime</i> (Aventis, France)
• <i>Diflucan</i> (Pfizer) – fluconazole	† melarsoprol – <i>Mel-B</i>
§ diloxanide furoate – <i>Furamide</i> (Boots, United Kingdom)	† <i>Mel-B</i> – melarsoprol
doxycycline – <i>Vibramycin</i> (Pfizer), others	<i>Mepron</i> (GlaxoSmithKline) – atovaquone
eflornithine (Difluoromethylornithine, DFMO) – <i>Ornidyl</i> (Aventis)	metronidazole – <i>Flagyl</i> (Pfizer), others

(continued)

• <i>NebuPent</i> (Fujisawa) – pentamidine isethionate	§ pyrimethamine USP – <i>Daraprim</i> (GlaxoSmithKline)
§ niclosamide – <i>Yomesan</i> (Bayer, Germany)	<i>Qualaquin</i> – quinine sulfate (Mutual Pharmaceutical Co/AR Scientific)
† nifurtimox – <i>Lampit</i> (Bayer, Germany)	quinacrine
nitazoxanide – <i>Alinia</i> (Romark)	* quinidine gluconate (Eli Lilly)
<i>Nix</i> (GlaxoSmithKline) – permethrin	§ quinine dihydrochloride
• <i>Nizoral</i> (Janssen) – ketoconazole	quinine sulfate – <i>Qualaquin</i> (Mutual Pharmaceutical Co/AR Scientific)
§ ornidazole – <i>Tiberal</i> (Roche, France)	<i>Riamet</i> (Novartis) – artemether/lumefantrine
<i>Ornidyl</i> (Aventis) – eflornithine (Difluoromethylornithine, DFMO)	• <i>RID</i> (Pfizer) – pyrethrins and piperonyl butoxide
<i>Ovide</i> (Medicis) – malathion	• <i>Rifadin</i> (Aventis) – rifampin
§ oxamniquine – <i>Vansil</i> (Pfizer)	rifampin – <i>Rifadin</i> (Aventis), others
§ <i>Paludrine</i> (AstraZeneca, United Kingdom) – proguanil	§ <i>Rochagan</i> (Brazil) – benznidazole
paromomycin – <i>Humatin</i> (Monarch); <i>Leshcutan</i> (Teva, Israel; topical formulation not available in US)	* <i>Rovamycin</i> (Aventis) – spiramycin
<i>Pentam</i> 300 (Fujisawa) – pentamidine isethionate	† sodium stibogluconate – <i>Pentostam</i> (GlaxoSmithKline, United Kingdom)
pentamidine isethionate – <i>Pentam</i> 300 (Fujisawa), <i>NebuPent</i> (Fujisawa)	* spiramycin – <i>Rovamycin</i> (Aventis)
† <i>Pentostam</i> (GlaxoSmithKline, United Kingdom) – sodium stibogluconate	• <i>Sporanox</i> (Janssen-Ortho) – itraconazole
permethrin – <i>Nix</i> (GlaxoSmithKline), <i>Elimite</i> (Allergan)	<i>Stromectol</i> (Merck) – ivermectin
§ praziquantel – <i>Biltricide</i> (Bayer)	sulfadiazine – (Eon)
primaquine phosphate USP	† suramin sodium – <i>Germanin</i> (Bayer, Germany)
§ proguanil – <i>Paludrine</i> (AstraZeneca, United Kingdom)	§ <i>Tiberal</i> (Roche, France) – ornidazole
proguanil/atovaquone – <i>Malarone</i> (GlaxoSmithKline)	<i>Tindamax</i> (Mission) – tinidazole
§ propamidine isethionate – <i>Brolene</i> (Aventis, Canada)	tinidazole – <i>Tindamax</i> (Mission)
§ pyrantel pamoate – <i>Antiminth</i> (Pfizer)	TMP/Sulfa – <i>Bactrim</i> (Roche), others
pyrethrins and piperonyl butoxide – <i>RID</i> (Pfizer), others	§ triclabendazole – <i>Egaten</i> (Novartis)
	§ <i>Vansil</i> (Pfizer) – oxamniquine
	• <i>Vermox</i> (McNeil) – mebendazole
	• <i>Vibramycin</i> (Pfizer) – doxycycline
	• <i>Yodoxin</i> (Glenwood) – iodoquinol
	§ <i>Yomesan</i> (Bayer, Germany) – niclosamide
	• <i>Zithromax</i> (Pfizer) – azithromycin

* Available in the US only from the manufacturer.

§ Not available commercially. It may be obtained through compounding pharmacies such as Panorama Compounding Pharmacy, 6744 Balboa Blvd, Van Nuys, CA 91406 (800-247-9767) or Medical Center Pharmacy, New Haven, CT (203-688-6816). Other compounding pharmacies may be found through the National Association of Compounding Pharmacies (800-687-7850) or the Professional Compounding Centers of America (800-331-2498, www.pccarx.com).

† Available from the CDC Drug Service, Centers for Disease Control and Prevention, Atlanta, Georgia 30333; 404-639-3670 (evenings, weekends, or holidays: 770-488-7100).

• Also available generically.

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